Acadian Ambulance/ National EMS Academy

EMS Stroke Management

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Stroke Webinar Series
Session 2

LOUISIANA EMERGENCY RESPONSE NETWORK

Objectives

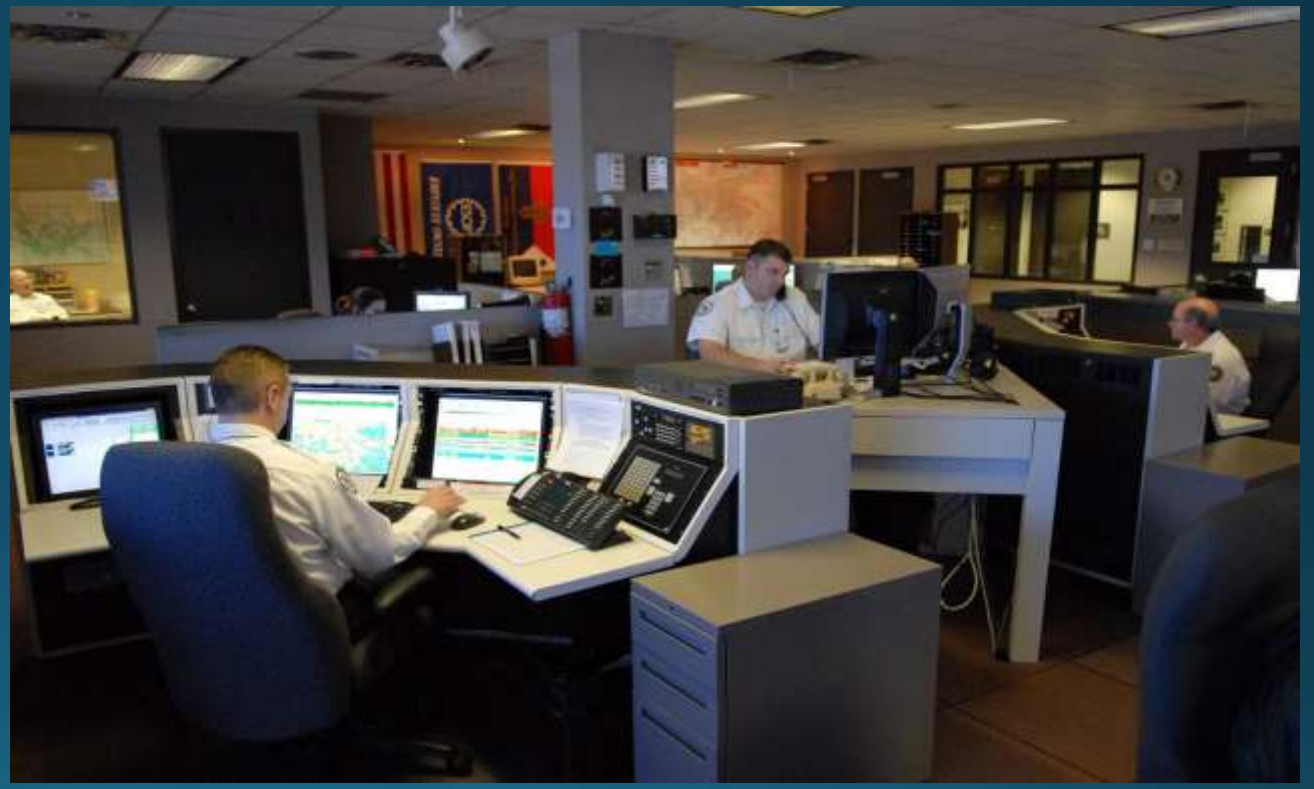
- Define the call taking and dispatch process for suspected stroke
- Understand EMS assessment process
- Describe EMS management of suspected stroke
- Identify factors in determining optimum transport methods and patient destination

Stroke Incidence

- >700,000 occur annually
- About 2% of all EMS calls nationwide
- Acadian responded to > 8000 suspected stroke calls in 2015 (Includes Interfacility and scene calls)

Detecting Stroke at Dispatch is a Challenge

- Phone Triage alone
  - U.K study showed <50% sensitivity for identifying and prioritizing stroke and need for improvement [1]
- Pro-QA Process
  - Automated tool to guide the dispatcher with prehospital patient care instructions
  - San Diego County showed 83% sensitivity and Positive Predictive Value of only 42% for stroke at Emergency Medical Dispatch [2]



1Deakin, C. D., et al. "Is ambulance telephone triage using advanced medical priority dispatch protocols able to identify patients with acute stroke correctly?." Emergency Medicine Journal 26.6 (2009): 442-445.

2Ramanujam, Prasanthi, et.al. "Accuracy of stroke recognition by emergency medicine dispatchers and paramedics-San Diego experience." *Prehospital Emergency Care* 12.3 (2008) 307-313.

EMS Assessment

- EMS Assessment has significant variability
  - Cincinnati Prehospital stroke scale or CPSS remains the most common EMS assessment tool with a sensitivity of 79% but poor specificity at 24% [1]
  - Takes less than 2 minutes to perform
- Miami Emergency Neurologic Deficit (MEND) and Los Angeles Prehospital Stroke Scales
  - adds components of NIH exam to increase specificity but lowers overall detection rates [2]

1 - Studnek, Jonathan R., et al. "Assessing the validity of the Cincinnati prehospital stroke scale and the medic prehospital assessment for code stroke in an urban emergency medical services agency." *Prehospital Emergency Care* 17.3 (2013): 348-353.

2- Rudd, Matthew, et al. "A systematic review of stroke recognition instruments in hospital and prehospital settings." *Emergency Medicine Journal* (2015): emermed-2015

Assessment outside the ED

F.A.S.T. / Cincinnati Prehospital Stroke Scale

F- Facial droop

A - Arm drift

S - Speech difficulty

T - Time to call 911/ EMS = Time of Onset

(Time last seen normal)

CPSS assessment identical to FAST but with scoring system

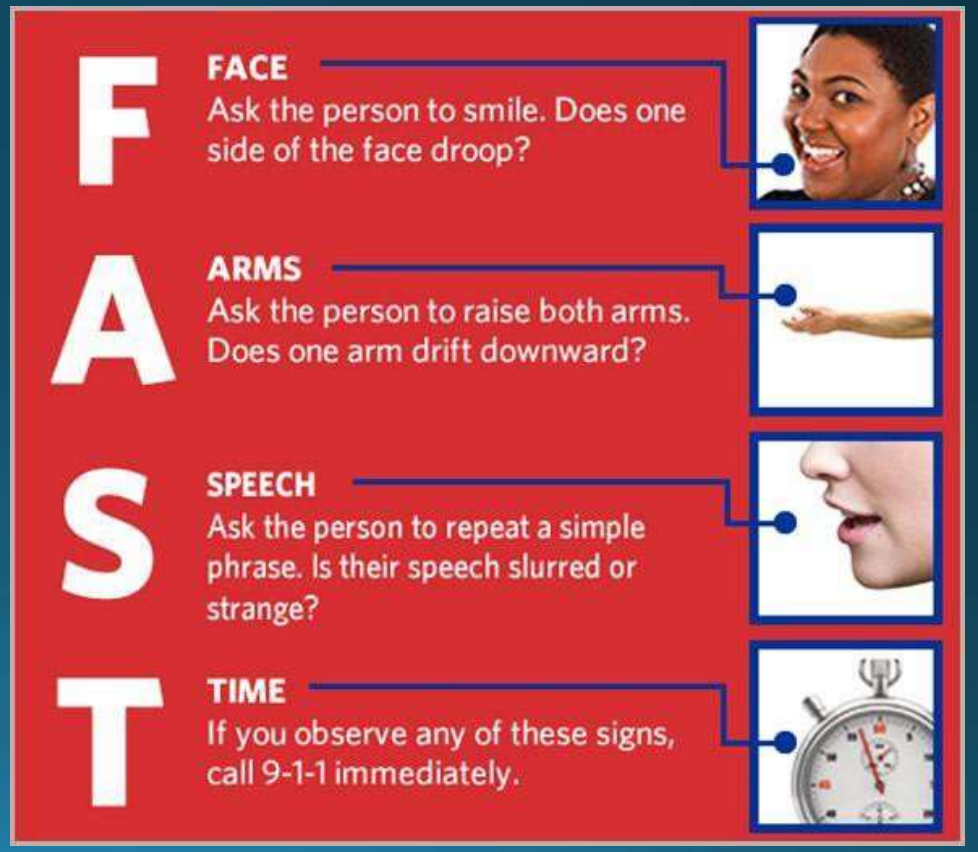


Image- AARP.com

The Future? Houston Mobile Stroke Unit

EMS Stroke Management

- Definitive Diagnosis and treatment is not possible in pre-hospital setting
- Primary Goals are rapid recognition of possible stroke and need for immediate transport to MOST appropriate facility

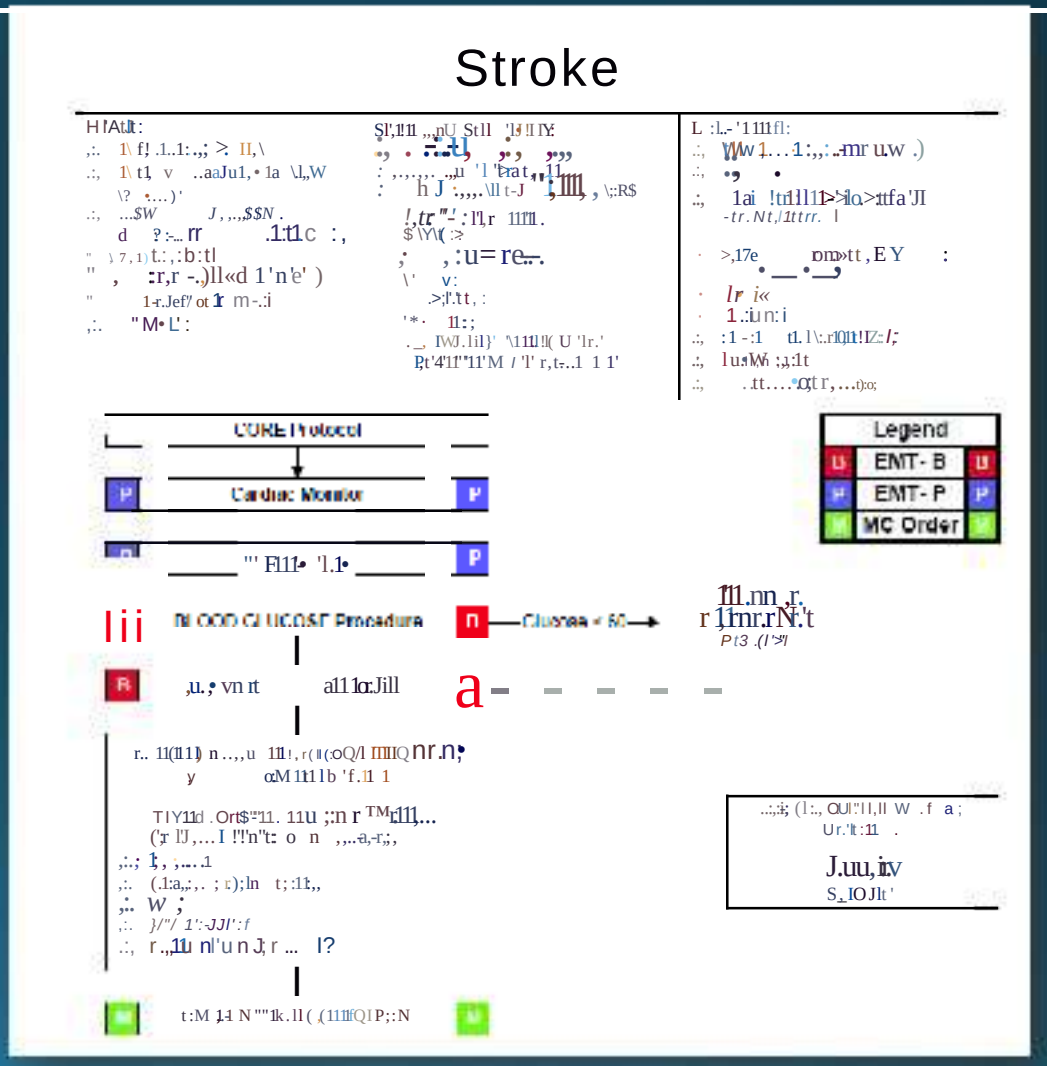
EMS Stroke Management

- Consists of
  - Support for ABC's
  - Transport decision making process
  - LERN Notification
  - Stroke Alert – Variable notification processes
- Facilitation of inter-facility transport when indicated (Drip and Ship)
- Suspected Large Vessel Occlusion Study

Southerland, Andrew M., et al. "Suspected Large Vessel Occlusion Should Emergency Medical Services Transport to the Nearest Primary Stroke Center or Bypass to a Comprehensive Stroke Center With Endovascular Capabilities?." *Stroke* (2016): STROKEAHA-115.

EMS Stroke Management

- Assessment and transport decision making guided by Regional protocols
- LERN can assist with identifying destination hospitals with resources for time –sensitive disease



Management

- Suction as needed
- Basic Airway adjuncts as indicated
- Supplemental oxygen titrated to SpO_2
- Intubation if GCS < 9 with failure to maintain airway
- Support of respiratory rate and effort if indicated using $EtCO_2$ as target

Assessment Tools and Targets

- GCS determination (< 9 Airway)
- Oxygen Saturation – > 95%
- Respiratory rate 8-12 / min
- $EtCO_2$ -35-45 mmHg
- B/P > 90 systolic at all times
- CBG > 50-90 mg/dl
- ECG monitoring

Stroke Alert

- Follows Regional Alert Criteria
  - Positive stroke indications from CPSS or MEND
  - Time of onset less than 8 hours
  - No history of recent head trauma or seizure
  - CBG greater 50 mg/dl
  - Greater than 18 years of age

LERN Hospital Classification

- Four levels of classification
  - 1 – Comprehensive Stroke Center (CSC) 24/7 Neuro capable facility
  - 2- Primary Stroke Center (PSC) with or without endovascular capability and neurosurgery within 2 hours of activation
  - 3- Tertiary Stroke Center - 24/7 lab and CT imaging for Drip- and- ship protocol
  - 4 – No CT or Lab
- Louisiana protocol recommends closest Level 1,2 or 3 for rapid access to thrombolytic therapy and rapid referral to Level 1 or 2 as needed

Quality Assessment Tools and Targets

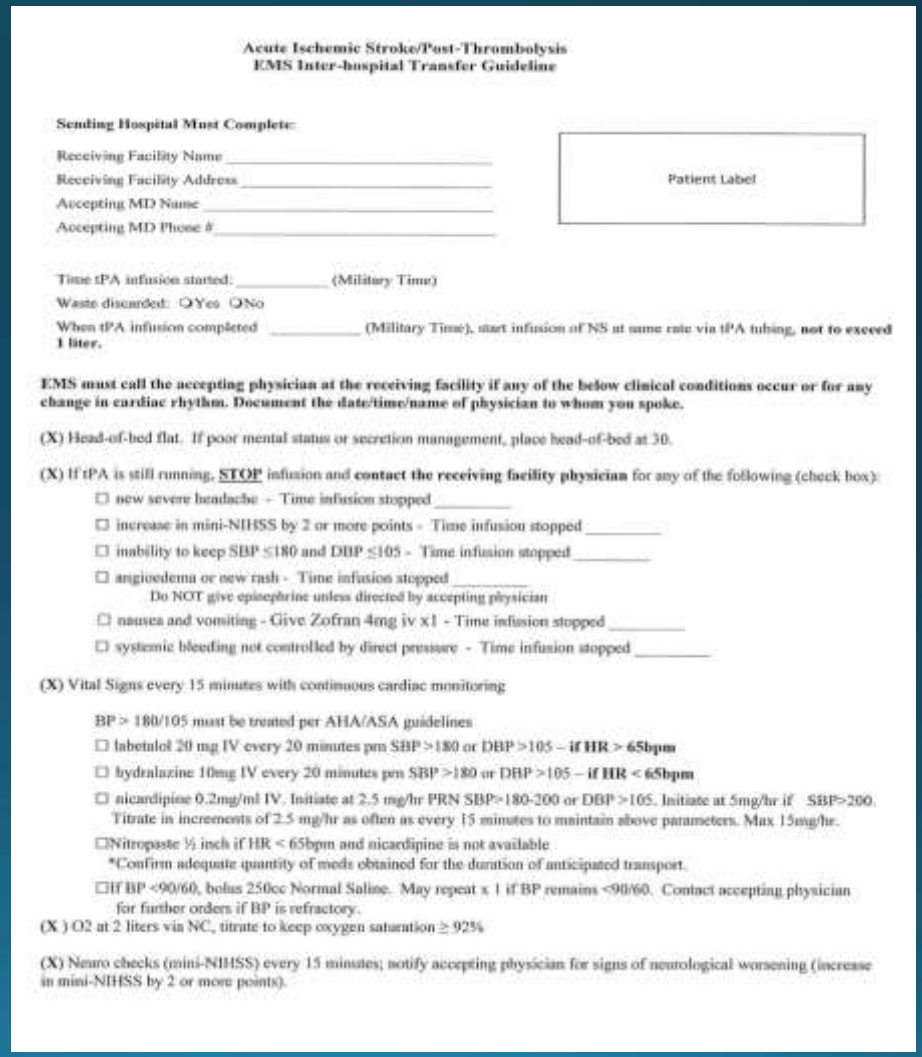
- Scene Time
  - < 10 minutes
- CBG measurement
  - 100% compliance
- Future Measurements?
  - FMC to Definitive Treatment
  - Regional Protocol Compliance

Transport

- Transport Destination using regional protocol if possible
- Air versus Ground
  - Time/ logistics driven
- < than 2 hrs. transport time transport directly to a primary stroke center
- > 2 hrs. transport to closest Tertiary Stroke Center

Interfacility Transport (Drip and Ship)

- Interfacility Transfer
- Documentation
- Pre-packaging patient and data is CRITICAL to shortening time at facility
- Choreography of EMS and hospital staff must be SEAMLESS



Acute Ischemic Stroke/Post-Thrombolysis
EMS Inter-hospital Transfer Guideline

Sending Hospital Must Complete:

Receiving Facility Name _____
Receiving Facility Address _____
Accepting MD Name _____
Accepting MD Phone # _____

Patient Label

Time tPA infusion started: _____ (Military Time)
Waste discarded: ○Yes ○No
When tPA infusion completed _____ (Military Time), start infusion of NS at same rate via tPA tubing, **not to exceed 1 liter.**

EMS must call the accepting physician at the receiving facility if any of the below clinical conditions occur or for any change in cardiac rhythm. Document the date/time/name of physician to whom you spoke.

(X) Head-of-bed flat. If poor mental status or secretion management, place head-of-bed at 30.

(X) If tPA is still running, **STOP** infusion and **contact the receiving facility physician** for any of the following (check box):

- ☐ new severe headache - Time infusion stopped _____
- ☐ increase in mini-NIHSS by 2 or more points - Time infusion stopped _____
- ☐ inability to keep SBP ≤180 and DBP ≤105 - Time infusion stopped _____
- ☐ angioedema or new rash - Time infusion stopped _____
  Do NOT give epinephrine unless directed by accepting physician
- ☐ nausea and vomiting - Give Zofran 4mg iv x1 - Time infusion stopped _____
- ☐ systemic bleeding not controlled by direct pressure - Time infusion stopped _____

(X) Vital Signs every 15 minutes with continuous cardiac monitoring

BP > 180/105 must be treated per AHA/ASA guidelines

- ☐ labetalol 20 mg IV every 20 minutes prn SBP >180 or DBP >105 – **if HR > 65bpm**
- ☐ hydralazine 10mg IV every 20 minutes prn SBP >180 or DBP >105 – **if HR < 65bpm**
- ☐ nicardipine 0.2mg/ml IV. Initiate at 2.5 mg/hr PRN SBP>180-200 or DBP >105. Initiate at 5mg/hr if SBP>200. Titrate in increments of 2.5 mg/hr as often as every 15 minutes to maintain above parameters. Max 15mg/hr.
- ☐Nitropaste ½ inch if HR < 65bpm and nicardipine is not available
  *Confirm adequate quantity of meds obtained for the duration of anticipated transport.
- ☐If BP <90/60, bolus 250cc Normal Saline. May repeat x 1 if BP remains <90/60. Contact accepting physician for further orders if BP is refractory.

(X) O2 at 2 liters via NC, titrate to keep oxygen saturation ≥ 92%

(X) Neuro checks (mini-NIHSS) every 15 minutes; notify accepting physician for signs of neurological worsening (increase in mini-NIHSS by 2 or more points).

Interfacility Transport (Drip and Ship)

- Mini NIH Stroke Scale

1a. Level of Consciousness	0 = Alert; keenly responsive. 1 = Drowsy; arousable by **minor stimulation** 2 = Stuporous; requires **repeated stimulation** to attend, or is obtunded and requires **strong or painful stimulation** to make movements. 3 = Coma; responds only with reflex motor or autonomic effects or totally unresponsive, flaccid, and areflexic.
1b. **LOC Questions:** The patient is asked the month and his/her age. The answer must be correct-there is no partial credit for being close. If intubated, arbitrarily score 1.	0 = Answers **both** questions correctly. 1 = Answers **one** questions correctly. 2 = Answers **neither** questions correctly.
1c. **LOC Commands:** The patient is asked to open and close the eyes and then to grip and release the non-paretic hand. Demonstration is permitted.	0 = Performs **both** tasks correctly. 1 = Performs **one** task correctly. 2 = Performs **neither** task correctly.
Motor Arm: The limb is placed in the appropriate position: extend the arms (palms down) 45 degrees. 10 second count for arm. **Motor Leg:** The limb is placed at 30 degrees. 5 second count for leg. Demonstration is permitted. Each limb is tested in turn, beginning with the non-paretic side.	0 = **No drift**; limbs holds for full count. 1 = **Drift;** drifts before full count; does not hit the bed or other support. 2 = **Some effort against gravity**; limb cannot get to, or maintain position, drifts to bed, but has some effort against gravity. 3 = **No effort against gravity**; limb falls 4 = **No movement.**

Questions?

Next Session:

Acute Stroke Management

Stroke Webinar Series Session 3

March 24, 2016 at 10:00 am

Presented by: Dr. Joseph Acosta